

APPENDIX B
SITE-SPECIFIC DATA QUALITY OBJECTIVES

DATA QUALITY OBJECTIVE NO. 1 EXXON PIPELINE MAYFLOWER

MEDIA OF CONCERN: WASTE/SOURCE

STEP 1. STATE THE PROBLEM	
Contaminants may be present representing a threat to human health and the environment.	
STEP 2. IDENTIFY THE DECISION	
Waste source samples will be collected from an area of the pipeline near the rupture site to (1) identify the source (2) classify the source type and (3) identify the contaminants of concern (COCs) associated with the source area.	
IDENTIFY THE ALTERNATIVE ACTIONS THAT MAY BE TAKEN BASED ON THE DECISIONS.	<ul style="list-style-type: none"> If the COCs identified in the waste samples are consistent with the Potentially Responsible Party (PRP) product, then the COCs can be attributable to the site and used for future environmental sampling as background data. If the COCs identified in the waste samples are not consistent with the PRP product, then the COCs may not be attributable to the site.
STEP 3. IDENTIFY INPUTS TO THE DECISION	
IDENTIFY THE INFORMATIONAL INPUTS NEEDED TO RESOLVE A DECISION.	<ul style="list-style-type: none"> Review PRP crude oil product MSDS Contaminant concentrations in waste samples collected during sampling.
IDENTIFY THE SOURCES FOR EACH INFORMATIONAL INPUT AND LIST THE INPUTS THAT ARE OBTAINED THROUGH ENVIRONMENTAL MEASUREMENTS.	<ul style="list-style-type: none"> Sample locations as shown in Figure 2-1. Analytical results from the laboratory analyses specified below.
BASIS FOR THE CONTAMINANT SPECIFIC ACTION LEVELS.	Crude oil/waste source samples will be used to establish source COCs in order to attribute potential releases from the Site to the air, soil, and surface water pathways.
IDENTIFY POTENTIAL SAMPLING TECHNIQUES AND APPROPRIATE ANALYTICAL METHODS.	<ul style="list-style-type: none"> Target Compound List (TCL) Volatiles Organic Compounds (VOC) by SW846 Method 8260. TCL Semivolatile Organic Compounds (SVOCs) by SW846 Method 8270. TCL Pesticides by SW846 Method 8081 TCL PCBs by SW846 Method 8082 TCL Herbicides by SW846 Method 8151 TAL Metals including mercury – Method 6010C/7471 API Gravity Specific Gravity
STEP 4. DEFINE THE BOUNDARIES OF THE STUDY	
DEFINE THE DOMAIN OR GEOGRAPHIC AREA WITHIN WHICH ALL DECISIONS MUST APPLY.	Crude oil/waste and contamination attributable to the Exxon Pipeline Mayflower Oil Spill.
SPECIFY THE CHARACTERISTICS THAT DEFINE THE POPULATION OF INTEREST.	Contaminant concentrations in crude oil/waste source samples.
DEFINE THE SCALE OF DECISION MAKING.	Results of crude oil/waste source samples will be used to establish source COCs in order to attribute potential releases from the Site to the soil, air and surface water pathways.
DETERMINE THE TIME FRAME TO WHICH THE DATA APPLY.	The data will apply until the crude oil/waste source represented by the samples receives appropriate response actions.

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MEDIA OF CONCERN: WASTE/SOURCE (continued)

STEP 4. DEFINE THE BOUNDARIES OF THE STUDY (Continued)	
DETERMINE WHEN TO COLLECT DATA.	Samples will be collected during the EPA Team response effort.
IDENTIFY PRACTICAL CONSTRAINTS ON DATA COLLECTION.	<ul style="list-style-type: none"> • Inclement weather. • Environmental conditions (e.g. air monitoring data) • Access not attainable.
STEP 5. DEVELOP A DECISION RULE	
SPECIFY THE PARAMETER THAT CHARACTERIZES THE POPULATION OF INTEREST.	Detection of COCs in the waste samples by analytical testing..
SPECIFY THE ACTION LEVEL FOR THE DECISION.	<p>If the COCs identified in the waste samples are consistent with the PRP product, then the source area has been established/characterized.</p> <p>If no COCs are identified in the waste samples consistent with the PRP product then the source area has NOT been established/characterized and the waste represented by the samples will require additional attention.</p>
STEP 6. SPECIFY LIMITS ON DECISION ERRORS	
DEVELOP A DECISION RULE.	If crude oil/waste sample is defined as attributable to the PRP then the source area has been established/characterized.
DETERMINE THE POSSIBLE RANGE OF THE PARAMETER OF INTEREST.	Contaminant concentrations may range from 0 µg/mg to more than the contaminant specific action level.
DEFINE BOTH TYPES OF DECISION ERRORS AND IDENTIFY THE POTENTIAL CONSEQUENCES OF EACH.	<p><u>Type I Error:</u> Deciding that the specified area represented by the crude oil/waste sample does not exceed the specified assessment level when, in truth, the waste concentration of the contaminant exceeds its specified assessment level. The consequence of this decision error is that media contaminated with crude oil/waste will remain in place, possibly endangering human health and the environment. This decision error is more severe.</p> <p><u>Type II Error:</u> Deciding that the specified area represented by the crude oil/waste sample does exceed the specified assessment level when, in truth, it does not. The consequences of this decision error are that remediation of the crude oil/waste will continue and unnecessary costs will be incurred.</p>
ESTABLISH THE TRUE STATE OF NATURE FOR EACH DECISION RULE.	<p>The true state of nature when the waste is decided to be below the specified assessment levels when in fact, it is not below the specified assessment levels, is that the waste does need remedial action.</p> <p>The true state of nature when the waste is decided to be above the specified assessment levels when in fact, it is not above the specified assessment levels, is that the waste does not need remedial action.</p>

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MEDIA OF CONCERN: WASTE/SOURCE (continued)

STEP 6. SPECIFY LIMITS ON DECISION ERRORS (Continued)	
DEFINE THE TRUE STATE OF NATURE FOR THE MORE SEVERE DECISION ERROR AS THE BASELINE CONDITION OR THE NULL HYPOTHESIS (H_0) AND DEFINE THE TRUE STATE FOR THE LESS SEVERE DECISION ERROR AS THE ALTERNATIVE HYPOTHESIS (H_a).	<p>H_0: The waste represented by the sample is above the specified action level.</p> <p>H_a: The waste represented by the sample is below the specified action level.</p>
ASSIGN THE TERMS "FALSE POSITIVE" AND "FALSE NEGATIVE" TO THE PROPER DECISION ERRORS.	<ul style="list-style-type: none"> • False Positive Error = Type I • False Negative Error = Type II
ASSIGN PROBABILITY VALUES TO POINTS ABOVE AND BELOW THE ACTION LEVEL THAT REFLECT THE ACCEPTABLE PROBABILITY FOR THE OCCURRENCES OF DECISION ERRORS.	To be assigned based on discussions with EPA OSC.
STEP 7. OPTIMIZE THE DESIGN	
REVIEW THE DQOs.	Due to insufficient historical data, determination of the standard deviation was not possible. Therefore, sample size calculation using the traditional statistical formula may not be the optimal design. In order to select the optimal sampling program that satisfies the DQOs and is the most resource effective, other elements were considered.
<p>DEVELOP GENERAL SAMPLING AND ANALYSIS DESIGN.</p> <p>A total of two crude oil/waste samples will be collected from the pipeline rupture area located at the Exxon Mayflower Arkansas Oil Spill site and analyzed to determine the presence of crude oil parameters, waste source characterization, and to show potential attribution to the pathways of concern. The samples will be analyzed for TCL VOCs, TCL SVOCs, Pesticides, PCB, Herbicides, TAL metals (including mercury), and API Gravity and Specific Gravity.</p>	